SUBSECTION 8.3

Cultural Resources

8.3 Cultural Resources

This section determines whether cultural resources are present and could be affected adversely by the Central Valley Energy Center (CVEC) project. The significance of any potentially affected resources is assessed and measures are proposed to mitigate potential adverse project effects. This study was conducted by Dr. James C. Bard and Mr. Jim Sharpe, M.S. (CH2M HILL Cultural Resource Specialists who meet the Standards and Guidelines for Archaeology and Historic Preservation (USNPS, 1983)).

This section is consistent with both federal and state regulatory requirements for cultural resources pursuant to Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966 (as amended) (16 USC 470f) and its implementing regulations, 36 CFR Part 800, and the California Environmental Quality Act (CEQA). The study scope was developed in consultation with the CEC's cultural resources staff and complies with *Instructions to the California Energy Commission Staff for the Review of and Information Requirements for an Application for Certification* (CEC, 1992) and *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 1997).

Cultural resources include prehistoric and historic archaeological sites;[1] districts and objects; standing historic structures, buildings, districts and objects; and, locations of important historic events, or sites of traditional/cultural importance to various groups.[2]

Section 8.3.1 discusses the laws, ordinances, regulations, and standards (LORS) applicable to the protection of cultural resources. Section 8.3.2 describes the cultural resources environment that might be affected by the CVEC. Section 8.3.3 discusses the environmental consequences of construction of the proposed development. Section 8.3.4 determines if there are any cumulative effects from the project and Section 8.3.5 presents mitigation measures that will be implemented to avoid construction impacts. Section 8.3.6 lists the agencies involved and agency contacts and Section 8.3.7 discusses permits and the permitting schedule. Section 8.3.8 provides a list of reference materials used in preparing this section.

Confidential Appendix 8.3C, provided under separate cover, depicts areas surveyed by CH2M HILL for the project and provides annotated USGS maps of archive results and a photographed description of an isolate found during surveying. Appendix 8.3A provides copies of agency consultation letters. Appendix 8.3B provides the proposed Native American Burial Protection Plan for the project.

If possible, all recorded cultural resources will be avoided completely by the CVEC project. However, if avoidance is not possible through project redesign, the significance of the affected resources will be evaluated formally using appropriate federal and/or state and local cultural resource

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1 "Site" – "the location of a significant event, a prehistoric or historic occupation or activity, or a building or structure…where the location itself possesses historic, cultural, or archeological value" (USNPS-IRD, 1991:15).

2 The "federal" definitions of cultural resource, historic property or historic resource, traditional use area, sacred resources are reviewed below and are typically applied to non-federal projects.

A cultural resource may be defined as a phenomenon associated with prehistory, historical events or individuals or extant cultural systems. These include archaeological sites, districts and objects; standing historic structures, districts and objects; locations of important historic events; and, places, objects and living or non-living things that are important to the practice and continuity of traditional cultures. Cultural resources may involve historic properties, traditional use areas and sacred resource areas.

Historic property or historic resource means any prehistoric district, site building, structure or object included in, or eligible for, inclusion in the National Register of Historic Places. The definition also includes artifacts, records and remains that are related to such a district, site, building, structure or object.

Traditional use area refers to an area or landscape identified by a cultural group to be necessary for the perpetuation of the traditional culture. The concept can include areas for the collection of food and non-food resources, occupation sites and ceremonial and/or sacred areas.

Sacred resources applies to traditional sites, places or objects that Native American tribes or groups, or their members, perceive as having religious significance.

significance evaluation criteria and guidelines. If a resource is determined to be significant, a data recovery program or some other appropriate mitigative effort will be undertaken in consultation with the CEC.

The CVEC project is subject to CEC and CEQA permitting requirements. If the project becomes subject to federal agency involvement (permitting, licensing, etc.), additional authorities related to cultural resources may be triggered, including the National Environmental Policy Act and the Archaeological and Historic Preservation Act (AHPA) of 1974 (16 USC 469), among others. The AHPA includes requirements to coordinate with the Secretary of the Interior for notification, data recovery, protection and/or preservation when a federally licensed project may cause the irreparable loss or destruction of significant scientific, prehistoric, historic, or archaeological data. In 1983, the Secretary of the Interior established standards for gathering and treating data related to cultural resources in *Standards and Guidelines for Archaeology and Historic Preservation*.

8.3.1 Laws, Ordinances, Regulations and Standards

A summary of applicable LORS is provided in Table 8.3-1.

8.3.1.1 Federal Statutes/Regulations

The NHPA of 1966 (as amended) established the federal government's policy on historic preservation and the programs, including the National Register of Historic Places (NRHP), through which that policy is implemented. Under the NHPA, historic properties include "…any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (16 USC 470w (5)).[3] The NHPA of 1966 (as amended) and its implementing regulations (16 USC 470 et seq., 36 CFR Part 800, 36 CFR Part 60, and 36 CFR Part 63) require the agency(ies) to consider the effect of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) a reasonable opportunity to comment on any undertaking that could adversely affect cultural properties listed or eligible for listing on the NRHP.

If a Clean Water Act (CWA) Section 404 permit is required for construction (wetland fills or crossings), the NHPA of 1966 (as amended) and its implementing regulations (16 USC 470 et seq., 36 CFR Part 800, 36 CFR Part 60, and 36 CFR Part 63) also apply. The U.S. Army Corps of Engineers (USACOE), as lead federal agency for issuing the CWA Section 404 permit, would be the lead agency for NHPA Section 106 compliance and consultation with the SHPO and ACHP would be required.

8.3.1.2 State of California Statutes

CEQA requires review to determine if a project will have a significant effect on archaeological sites or a property of historic or cultural significance to a community or ethnic group eligible for inclusion in the California Register of Historical Resources (CRHR) (CEQA Guidelines).

3 The National Register criteria for evaluation include: (1) is at least 50 years old; (2) retains integrity of location, design, setting, materials, workmanship, feeling, and association; and (3) has one or all of the following characteristics of association: (a) "…with events that have made a significant contribution to the broad patterns of our history;" (b) "…with the lives of persons significant in our past;" (c) "…that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction;" or, (d) "…have yielded, or may be likely to yield, information important in prehistory or history."

TABLE 8.3-1
Applicable Cultural Resource Laws, Ordinances, Regulations, and Standards

Law, Ordinance, Regulation, or Standard	Applicability	Project Conformity?	AFC Reference
California Environment Quality Act Guidelines	Project construction may encounter archaeological resources	Yes	Section 8.3.1
Health and Safety Code Section 7050.5	Construction may encounter Native American graves, Coroner calls NAHC	Yes	Appendix 8.3B
Public Resources Code Section 5097.98	Construction may encounter Native American graves, NAHC assigns Most Likely Descendant	Yes	Appendix 8.3B
Public Resources Code Section 5097.5/5097.9	Would apply only if some project land were acquired by the state (currently no state land)	Yes	Section 8.3.1
National Historic Preservation Act	Issuance of a Clean Water Act Section 404 permit is a federal undertaking	Yes	Section 8.3.7
Archaeological Resources Protection Act	Protects archaeological resources from vandalism and unauthorized collecting on federal land	Yes	Section 8.3.1
Native American Graves Protection and Repatriation Act	Assigns ownership of Native American graves on federal land to Native American descendants or culturally affiliated organizations	Yes	Appendix 8.3B
Fresno County General Plan Update 2000	Sets policies to preserve historically and archaeologically significant structures, sites, districts and artifacts	Yes	Section 8.3.1
City of San Joaquin 1996 Comprehensive Plan/EIR	No City of San Joaquin General Plan or Zoning Ordinance requirements address cultural or historic resources	Not Applicable	Section 8.3.1

CEQA equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21084.1 of the Public Resources Code) and defines substantial adverse change as demolition, destruction, relocation, or alteration that would impair historical significance (Section 5020.1). Section 21084.1 stipulates that any resource listed in, or eligible for listing in, the CRHR[4] is presumed to be historically or culturally significant.[5]

Resources listed in a local historic register or deemed significant in a historical resource survey (as provided under Section 5024.1g) are presumed historically or culturally significant unless the

4 The California Register of Historical Resources is a listing of "…those properties which are to be protected from substantial adverse change." Any resource eligible for listing in the California Register is also to be considered under CEQA.

5 A historical resource may be listed in the California Register of Historical Resources if it meets one or more of the following criteria: "(1) is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; (2) is associated with the lives of persons important to local, California or national history; (3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or, (4) has yielded or has the potential to yield information important in prehistory or history (…of the local area, California or the nation)" (Public Resources Code §§5024.1, Title 14 CCR, Section 4852). Automatic CRHR listings include National Register of Historic Places (NRHP) listed and determined eligible historic properties (either by the Keeper of the NRHP or through a consensus determination on a project review); State Historical Landmarks from number 770 onward; Points of Interest nominated from January 1998 onward. Landmarks prior to 770 and Points of Historical Interest may be listed through an action of the State Historical Resources Commission.

preponderance of evidence demonstrates they are not. A resource that is not listed in, or determined to be eligible for listing in the CRHR, is not included in a local register of historic resources, or not deemed significant in a historical resource survey, may nonetheless be historically significant (Section 21084.1; see Section 21098.1).

CEQA requires a Lead Agency to identify and examine environmental effects that may result in significant adverse effects. Where a project may adversely affect a unique archaeological resource,[6] Section 21083.2 requires the Lead Agency to treat that effect as a significant environmental effect and prepare an Environmental Impact Review (EIR). When an archaeological resource is listed in or is eligible to be listed in the CRHR, Section 21084.1 requires that any substantial adverse effect to that resource be considered a significant environmental effect. Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a project may have a potential adverse effect on archaeological resources.

Other state-level requirements for cultural resources management appear in the California Public Resources Code Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency.

The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and Sections 5097.94 and 5097.98 of the Public Resources Code, and falls within the jurisdiction of the Native American Heritage Commission (NAHC).

If human remains are discovered, the Fresno County Coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the Coroner is responsible for contacting the NAHC within 24 hours. The NAHC, pursuant to Section 5097.98, will immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal.

8.3.1.3 Local Policies

8.3.1.3.1 Fresno County

The Fresno County General Plan Update (January 2000) Chapter 6 (Recreation, Historical, and Archaeological Resources) provides background information on historical and cultural resources including the historical development of Fresno County, historical sites and structures, and the region's prehistory and archaeological data (Fresno County, 2000a). Appendix 6-A (Historic Resources) of the Fresno County General Plan Update lists all known/recorded historic properties (except archaeological sites) in the county (Fresno County, 2000a).

As described in Chapter 4.7 (Cultural Resources) of the General Plan Update EIR (February 2000), the Draft General Plan contains the following policies aimed at preserving and protecting cultural resources (Fresno County, 2000b):

Policy OS-J.1

The County shall require that discretionary development projects, as part of any required CEQA review, identify and protect historical, archaeological, paleontological, and cultural sites and their

6 Public Resources Code 21083.2 (g) defines a unique archaeological resource to be: An archaeological artifact, object, or site, about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria: (1) contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information; (2) has a special and particular quality such as being the oldest of its type or the best available example of its type; or, (3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

contributing environment from damage, destruction, and abuse to the maximum extent feasible. Project-level mitigation shall include accurate site surveys, consideration of project alternatives to preserve archaeological and historic resources, and provision for resource recovery and preservation when displacement is unavoidable.

Policy OS-J.2
The County shall, within the limits of its authority and responsibility, maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

Policy OS-J.3
The County shall solicit the view of the local Native American community in cases where development may result in disturbance to sites containing evidence of Native American activity and/or sites of cultural importance.

Policy OS-J.4
The County shall maintain an inventory of all sites and structures in the County determined to be of historical significance (Index of Historic Properties in Fresno County).

Policy OS-J.5
The County shall support the registration of property owners and others of cultural resources in appropriate landmark designations (i.e., National Register of Historic Places, California Historical Landmarks, Points of Historical Interest, or Local Landmark).

Policy OS-J.6
The County shall provide for the placement of historical markers or signs on adjacent County roadways and major thoroughfares to attract and inform visitors of important historic resource sites. If such sites are open to the public, the County shall ensure that access is controlled to prevent damage or vandalism.

Policy OS-J.7
The County shall use the State Historic Building Code and existing legislation and ordinances to encourage preservation of cultural resources and their contributing environment.

Policy OS-J.8
The County shall support efforts of other organizations and agencies to preserve and enhance historic resources for educational and cultural purposes through maintenance and development of interpretive services and facilities at County recreational areas and other sites.

8.3.1.3.2 City of San Joaquin

The City of San Joaquin's 1996 Comprehensive General Plan and EIR states that there are no known archaeological sites identified in the planning area and that the State of California has no designated historical landmarks within the planning area; however, there are historical structures and architecture of local significance located in the city (City of San Joaquin, 1996:20). This plan and EIR also states that certain older buildings may be torn down or altered as part of redevelopment; the historic value of these older structures will be reviewed on a case by case basis (and) a few have unique architectural features and may qualify for historic registry (City of San Joaquin, 1996:101).

The City of San Joaquin's (2001) Southeast Area Annexation Initial Study/Negative Declaration (IS/ND) states that no City of San Joaquin General Plan or Zoning Ordinance requirements address cultural or historic resources (City of San Joaquin, 2001). Mitigation Measure 5, proposed in the Southeast Area Annexation IS/ND, would (in addition to existing regulatory requirements) reduce potential impacts to prehistoric and historic resources to a less than significant level:

Prior to initiation of any grading, clearing, excavation, or ground disturbance within the project area, the City of San Joaquin or other appropriate lead agency shall consult with a qualified archaeologist to determine the archaeological sensitivity of the proposed development site. This determination shall be based on archival research, interviews, and other accepted methods. If the likelihood of encountering cultural resources is high, and such resources cannot be avoided by side design, the City of San Joaquin or other appropriate lead agency shall require the establishment and implementation of an approved research plan. Such a plan may include measuring, describing, and photographing the resources: collecting any artifactual materials; excavating deposits; and reporting on the finds.

If the likelihood of encountering cultural resources is low, ground disturbance may be permitted. If, at any point during construction, should any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered, work shall be suspended and the City of San Joaquin or other appropriate lead agency shall be notified. The City or other agency shall consult with a qualified archaeologist to determine if the encountered resources are "important" cultural resources within the definition of CEQA Guidelines 150064.5. The consulting archaeologist shall develop, if necessary, further mitigation measures consistent with CEQA Guidelines 15064.5 to reduce any cultural resource impact to less than a significant level.

8.3.2 Affected Environment

Cultural resources are traces of human occupation and activity. In Central California, cultural resources extend back in time for at least 11,500 years. Written historical sources tell the story of the past 200 years. Archaeologists have reconstructed general trends of prehistory. A cultural resources field inventory of the project area located potentially significant cultural resources within the project's Area of Potential Effect (APE). Contact with the NAHC did not result in the identification of traditional cultural properties in the project area.

Previous cultural resource studies conducted within a 1.0-mile radius of the proposed CVEC were reviewed. A discussion of the cultural resources sites in conflict with, or in potential conflict with, project elements (plant site, natural gas supply lines, etc.) are addressed in Section 8.3.3. The following elements are included in the CVEC (see Confidential Appendix 8.3C) and its area of potential effect:

- CVEC generation plant site
- Natural gas supply line
- Recycle process water line
- Domestic water supply line
- Sanitary sewer discharge line
- 230-kV transmission interconnect and 70-kV reroute

8.3.2.1 Natural Environment

The CVEC project site is located within the San Joaquin Valley, the southern half of the physiographic province known as the Great Valley. The Great Valley is an elongated trough about 400 miles long and 50 miles wide; between the Mesozoic and Cenozoic eras, it was a shallow marine embayment containing numerous lakes. The upper levels of the Great Valley floor are composed of alluvium and flood materials. The San Joaquin River is main hydrologic feature and annual rainfall in the project area ranges between 6 and 14 inches per year. Winters are cooler and drier than those in the Sacramento Valley and snow is not common. Summers are generally hot and dry with temperatures often exceeding 100 degrees Fahrenheit (°F).

The San Joaquin Valley is structured by a series of faults and folds including the Buena Vista Thrust, Kern Front, and White Wolf faults (Norris and Webb, 1990:240). Marine formations of the Cretaceous and Miocene overlie either chert or granite. Alluvium and sand deposited during the Holocene form the upper strata of the valley floor and comprise the primary sediments found within the project area.

Prior to the development of valley agriculture, marshy wetlands surrounding sluggish waterways such as the San Joaquin River supported marshy or aquatic communities of tule (Scirpus sp.), cottonwood (Populus fremontii), sycamore (Platanus racemosa), and willow (Salix sp.) (see Wallace, 1978a:448-449). Sparse oak groves occurred along some waterway and likely included interior live oaks (Quercus wislizeni) and valley oaks (Q. lobata) thus providing a portion of the vegetal food sources utilized by prehistoric populations.

Euro-American settlement has probably altered the variety of nondomesticated animal species found in the project area. Larger mammals such as black bear (Ursus americanus), black-tailed deer (Odocoileus hemionus), mule deer (O. Heminous hemionus), and mountain lion (Felix concolor) are now limited to the surrounding foothills and mountain ranges. Tule elk (Cervus elaphus nannoides) and pronghorn (Antilocapra americana), once common throughout the valley, now exist in limited locations around the state (Jameson and Peeters, 1988:220, 225).

According to Clough and Secrest (1984:27-28) and Wallace (1978a:449), tule elk and pronghorn were a major food source for the Yokut Indians, and later explorers, trappers and early settlers. Other animals found in the project area include raccoon (Procyon lotor), striped skunk (Mephitis mephitis), California ground squirrel (Spermophilus beecheyi), and pocket gopher (Thomomys bottae).

The marshy wetlands once common in the area provided a rich habitat for migratory waterfowl such as the Mallard Duck (Anas platyrhynchos), Northern Pintail (A. acuta), and Green-winged Teal (A. crecca) currently found in the valley. Other birds include the Northern Flicker Woodpecker (Colaptes auratus), Great Blue Heron (Ardea herodias), Red-tailed Hawk (Buteo jamaicensis), Belted Kingfisher (Ceryle alcyon), and Red-winged Blackbird (Agelaius phoeniceus). The San Joaquin River once supported anadromous and freshwater fish including salmon (Oncorhynchus sp.), golden trout (Salmo aguabonita), river lamprey eel (Lampetra ayresi), and white sturgeon (Acipenser transmontanus).

On the I-5 side of the project area, the immediate vicinity is dominated by Valley Saltbush Scrub (Holland, 1986) and is characterized by saltbush (Atriplex polycarpa) and ruderal species such as annual sunflower (Helianthus annuus), red brome (Bromus madritensis ssp. Rubens), ripgut grass (Bromus diandrus), Russian thistle (Salsola tragus), and prickly lettuce (Lactuca seriola).

8.3.2.2 Prehistoric Background

The CVEC project area is situated in an area of variable archaeological sensitivity. As described by Flint (1999:5-6), very few investigations have focused on the immediate project area (City of Fresno Wastewater Treatment Plant), and thus little is known about prehistoric occupation within this "unclaimed territory" (see discussion below in section 8.3.l.3). Within Yokuts territory, several archaeological studies have been conducted (see summaries by Latta, 1977; Price, 1992; Spier, 1978; and Wallace, 1978a, b). As described by Flint (1999:5-6), archaeological remains have recently been discovered in the vicinity:

> Earthmoving at the wastewater treatment plant in 1994 exposed a buried deposit of ground stone and flaked stone artifacts (City of Fresno, 1994-1995). City plant workers also have collected isolated artifacts (e.g., stone bowl mortars, pestles, manos) from various locations around the facility. Another buried cache of ground stone implement (CA-FRE-525) was unearthed during excavation at a cemetery approximately 3 miles northwest of the plant (Jennings, 1971). None of

these materials have been analyzed, consequently no periods of use or tribal association has been determined.

Past investigations in the valley have identified other buried prehistoric deposits where not surface materials were visible (cf. Fredrickson and Grossman, 1977; Jennings, 1971; Moratto, 1988; Varner, 1975). Because of the amount of alluvium and flooding throughout the valley, buried sites are likely to be discovered only during earthmoving or after erosion. This likely inhibits the rate at which buried archaeological sites are discovered. Earthmoving at the wastewater treatment plant has shown that a substantial deposit of alluvium covers the project area and likely the surrounding vicinity as well. Artifacts recorded to date within the project vicinity further substantiate the presence of deeply buried deposits; therefore, additional studies would likely yield more data on habitation, subsistence, and other uses of the project area by the predecessors of the ethnographic Yokuts.

The Southern Valley Yokuts may have been occupying the region for almost 2,000 years (Wallace, 1978a:449) based on evidence obtained from buried cultural deposits. Radiocarbon dates from a buried component of the Buena Vista Lake site (CA-KER-116) indicates a period of occupation at 6000 B.C. (Fredrickson and Grossman, 1977). Wallace (1978a:449) suggests that tools recovered from this site were used to hunt big game but were later supplemented or replaced by ground stone tools for seed processing (Flint, 1999:6). The Northern Valley Yokuts probably entered the region more recently than their southern relatives. Artifacts recovered from four archaeological sites near the delta of the Sacramento and San Joaquin rivers are similar to materials associated with Phase 2 of the Late Horizon described by Bennyhoff and Heizer (1958), which has been dated to ca. A.D. 1500 (Wallace, 1978b:463).

A three-part cultural chronological sequence, the Central California Taxonomic System (CCTS) was developed by archaeologists to explain local and regional cultural change in prehistoric central California from about 4,500 years ago to the time of European contact (Lillard, Heizer, and Fenenga, 1939, and Beardsley, 1948, 1954). In 1969, several researchers who met at UC Davis worked out several substantive taxonomic problems that had developed with the CCTS. Table 8.3-2 summarizes David Fredrickson's (1994) cultural periods model and provides CCTS classification nomenclature (such as "Early Horizon," etc).

Moratto (1984) suggests the Early Horizon dated to circa 4,500 to 3,500/3,000 years ago with the Middle Horizon dating to circa 3,500 to 1,500 years ago and the Late Horizon dating to circa 1,500 to 250 years ago. The Early Horizon is the most poorly known of the period with relatively few sites known or investigated. Early Horizon traits include hunting, fishing, use of milling stones to process plant foods, use of a throwing board and spear ("atlatl"), relative absence of culturally affected soils (midden) at occupation sites, and elaborate burials with numerous grave offerings.

Middle Horizon sites are more common and usually have deep stratified deposits that contain large quantities of ash, charcoal, fire-altered rocks, and fish, bird and mammal bones. Significant numbers of mortars and pestles signal a shift to plant foods from reliance on hunted animal foods. Middle Horizon peoples generally buried their dead in a fetal position and only small numbers of graves contain artifacts (and these are most often utilitarian). Increased violence is suggested by the number of burials with projectile points embedded in the bones or with other marks of violence.

TABLE 8.3-2
Hypothesized Characteristics of Cultural Periods in California

1800 A.D. Upper Emergent Period Phase 2, Late Horizon	Clam disk bead money economy appears. More and more goods moving farther and farther. Growth of local specializations relative to production and exchange. Interpenetration of south and central exchange systems.
1500 A.D. Lower Emergent Period Phase 1, Late Horizon	Bow and arrow introduced, replace atlatl and dart; south coast maritime adaptation flowers. Territorial boundaries well established. Evidence of distinctions in social status linked to wealth increasingly common. Regularized exchanges between groups continue with more material put into the network of exchanges.
1000 A.D. Upper Archaic Period Middle Horizon Intermediate Cultures	Growth of sociopolitical complexity; development of status distinctions based on wealth. Shell beads gain importance, possibly indicators of both exchange and status. Emergence of group-oriented religious organizations; possible origins of Kuksu religious system at end of period. Greater complexity of exchange systems; evidence of regular, sustained exchanges between groups; territorial boundaries not firmly established.
500 B.C. Middle Archaic Period Middle Horizon Intermediate Cultures	Climate more benign during this interval. Mortars and pestles and inferred acorn economy introduced. Hunting important. Diversification of economy; sedentism begins to develop, accompanied by population growth and expansion. Technological and environmental factors provide dominant themes. Changes in exchange or in social relations appear to have little impact.
3000 B.C. Lower Archaic Period Early Horizon Early San Francisco Bay Early Milling Stone Cultures	Ancient lakes dry up as a result of climatic changes; milling stones found in abundance; plant food emphasis, little hunting. Most artifacts manufactured of local materials; exchange similar to previous period. Little emphasis on wealth. Social unit remains the extended family.
6000 B.C. Upper Paleo-Indian Period San Dieguito Western Clovis 8000 B.C.	First demonstrated entry and spread of humans into California; lakeside sites with a probable but not clearly demonstrated hunting emphasis. No evidence for a developed milling technology, although cultures with such technology may exist in state at this time depth. Exchange probably ad hoc on one-to-one basis. Social unit (the extended family) not heavily dependent on exchange; resources acquired by changing habitat.

The Late Horizon emerged from the Middle Horizon with continued use of many early traits and the introduction of several new traits. Late Horizon sites are the most common and are noted for their greasy soils (midden) mixed with bone and fire-altered rocks. The use of the bow-and-arrow, fetal-position burials, deliberately damaged ("killed") grave offerings and occasional cremation of the dead are the best known traits of this horizon. Acorn and seed gathering dominated the subsistence pattern with short and long-distance trade carried out to secure various raw materials. Compared to earlier peoples, Late Horizon groups were short in stature with finer bone structure; evidence perhaps of the replacement of original Hokan speaking settlers by Penutian speaking groups by circa 1,500 years ago.

Another scheme proposed by Chartkoff and Chartkoff (1984), shown in Table 8.3-3, is also used.

TABLE 8.3-3
The Chartkoff and Chartkoff (1984) Model of Cultural Periods in California

Pre-Archaic Period - 11,500-9,000 B.C.

Pre-Archaic populations were small and their subsistence included big game hunting of now extinct mammoth and mastodon. Research indicates that the Pre-Archaic economies were based on a wide-ranging hunting and gathering strategy, dependent to a large extent on local lake-marsh or lacustrine habitats.

Early to Middle Archaic Period - 9,000-4,000 B.C.

During the Early and Middle Archaic periods, prehistoric cultures began putting less emphasis on large-game hunting. Subsistence economies probably diversified somewhat, and Archaic era people started using such ecological zones as the coast littoral more intensively than before. Advances in technology (milling stones) indicate that new food processing methods became important, enabling more efficient use of certain plant foods, including grains and plants with hard seeds.

Late Archaic Period - 4,000-2,000 B.C.

An important technological advance was the discovery of a tannin-removal process for the abundant and nutritious acorns. Prehistoric trade networks developed and diversified, bringing raw materials and finished goods from one region to another. Resource exploitation, as during the Early and Middle Archaic, was generally seasonal. Bands moved between established locations within a clearly defined/defended territory, scheduling resource harvests according to their availability. Clustering of food resources along the shores of large lakes or the banks of major fish-producing rivers allowed for larger seasonal population aggregates. Dispersed resources, such as large and small game, during the winter prompted small family groups to disperse across the landscape for more efficient food harvesting. The spear thrower (atlatl) may have been introduced or increased in importance, accounting for a change in projectile point styles from the Western Stemmed to the Pinto and Humboldt series. Seed grinding increased in importance.

Early and Middle Pacific Periods - 2,000 B.C.-A.D. 500

The Pacific Period is marked by the advent of acorn meal as the most important staple food. Increasing population densities made it desirable and necessary for Indian populations to produce more food from available land and to seek more dependable food supplies. The increasing use of seed grinding and acorn leaching allowed for the exploitation of more dependable food resources; increased use of previously neglected ecological zones (the middle and high Sierran elevations) may also have been part of this trend.

Late Pacific Period – A.D. 500-1400

Around A.D. 500 – 600, a cultural watershed was triggered by the introduction of the bow and arrow, which replaced the spear thrower and dart as the hunting tool/weapon of choice. The most useful time markers for this period tend to be small projectile points/arrow tips. Another trend is the marked shift from portable manos/metates to bedrock mortars/pestles (Moratto, 1984). Moratto, et al. (1978) demonstrated that this was a time of cultural stress, during which trading activity abated, warfare was common, and populations shifted away from the Sierra Nevada foothills to higher mountain elevations. They explain these changes in terms of rapid climatic fluctuations, including a drier climate and a corresponding shift of vegetation zones.

Final Pacific Period - A.D. 1400-1789

Populations became increasingly sedentary and depended more on staple foods, even as the diversity of foods exploited increased. Permanent settlements with high populations were more common. Every available ecological niche was exploited, at least on a seasonal basis. Other trends included the resurgence of long-distance trade networks and the development of more complex social and political systems.

8.3.2.3 Ethnographic Background

The CVEC project facilities extend in an east-west corridor across the valley from I-5 on the west to about the Fresno-Clovis Wastewater Treatment Facility (WWTF) on the east – through an area whose exact ethnographic history is not well understood. Figure 8.3-1 provides a representation of the ethnographic background for the project area.

Bissonnette (1994:4) characterizes the ethnographic background of the Fresno-Clovis WWTF Expansion project area (Jensen and Cornelia Avenues) as follows:

> Ethnographically, the project site is located in what may be called "unclaimed territory." The closest tribal groups to the project area in historic times were the linguistically related Pitkachi, Gashou, and Wechikit (Yokuts). The Pitkachi had villages along the south bank of the San Joaquin River ten miles north of the project site. The Gashou occupied the area between the San Joaquin and Kings Rivers from the upper foothills to the lower Dry Creek area, beginning about eight miles northeast of the project site (Latta, 1977:163). The Wechikit lived along the Kings River around present-day Centerville, Sanger and Reedley, tem miles east of the project site (Latta, 1977:171). Resource-gathering and trading groups from these tribes may have ventured into the project area. This, of course, would have been more likely during wetter than present climatic intervals and seasons where surface water could have sustained important resources. Since historic times, water has not flowed across the plains naturally this far west of the foothills, except during floods, hence the streambed's name of "Dry Creek."

For that part of the CVEC project area that is located along Manning Avenue between Contra Costa and Ormsby Avenues, Bissonnette (1992:4-5) suggests the Tucuyu was the Yokuts group occupying the immediate vicinity:

> The protohistoric Tache, ranged from the Lemoore area to the hills west of Coalinga, that is, east and west of the Kings River and Fish Slough wetlands, south of the project area (Kroeber, 1925:484). By analogy with the Kawatchwah and the Tache, the Tucuyu probably inhabited both sides of the Fresno Slough, and perhaps the hills to the west of the project area, with hunting and gathering territory and trails in between.

What is known about the Yokuts is that they comprised some 60 or more tribal groups that lived throughout interior Central California and they traded with each other and with other groups west of the Coast Range and east of the Sierra Nevada. Family groups and individuals traveled up and down the state, trading with neighboring groups to the north and south. Their hunting and gathering life ways involved use of a broad range of natural resources the prehistoric environment had to offer. Aspects of the material culture and cultural geography of the Yokuts can be found in Kroeber (1925), Gayton (1948), and Latta (1977). Wallace (1978a,b) and Spier (1978) provide summaries of the general subsistence and settlement patterns of these Yokuts groups as recorded in the early 20th century.

Peak and Associates (1988a:1-3) provides a brief sketch of Yokuts culture in her investigation for new apartment housing projects in the City of San Joaquin:

> Trade was well-developed, with mutually-beneficial interchange of needed or desired goods. Obsidian, rare in the valley, was obtained by trade with Paiute and Shoshoni groups on the eastern side of the Sierra Nevada, where numerous sources of this material are located, and perhaps came also from Napa Valley to the north. Shell beads, obtained by the Yokuts from coastal people, and acorns, rare in the Great Basin, were among the many items exported to the east by Yokuts traders (Davis, 1961).
>
> Economic subsistence was based on the ubiquitous acorn, with substantial dependency on gathering and processing of wild seeds and other vegetable foods. The rivers, streams, and sloughs that formed a maze within the valley provided abundant food resources, such as fish, shellfish, and turtles. Game, wildfowl, and small mammals were trapped and hunted to provide protein augmentation of the diet. In all, the eastern portions of the valley provided a lush environment of varied food sources, and the estimated large prehistoric population reflected this abundance (Cook, 1955; Baumhoff, 1963).

> Settlements were oriented toward the water resource, with major villages situated near waterways that provided not only reliable water supplies but substantial food sources. Houses varied in size and shape (Latta, 1949; Kroeber, 1925), with most constructed from the readily-available tules found in the extensive marshes of the low-lying valley areas. Housepit depressions, still extant in the protected areas of the San Joaquin Valley, range in diameter from three to 18 meters. Depression depths reach 60 cm below the surrounding surface. The Yokuts of the interior valley, somewhat removed from the coastal incursions of the Spanish, maintained a large degree of cultural cohesiveness until the early 1820s.

The lifeways of the Yokuts were dramatically altered in the 1700s by Spanish explorers and missionaries who entered the valley. The introduction of Euro-American lifeways and new diseases proved devastating to the native population – traditional lifestyles were diminished and numerous people died from disease (Moratto, 1988:174).

8.3.2.4 Historical Background

Recorded history in Central California can be divided into three periods: the Spanish Period (1769-1821), the Mexican Period (1821-1848), and the American Period (1848-present).

8.3.2.4.1 Spanish Period

The first recorded penetration of the southern San Joaquin Valley was accomplished in 1772 by Pedro Fages whose written record describes the Valley as "a labyrinth of lakes and tulares in the middle of a great plain" (Wedel, 1941:12). The next most important penetration of Euro-Americans were Spanish explorers led by Lieutenant Gabriel Moraga in 1806 (Clough and Secrest, 1984:25-27). Moraga and his party tried to locate new lands for missions, find and return fugitive neophytes to the coastal missions, and relocate stolen livestock.

Distance and difficult terrain restricted mission activities to coastal areas, but disruption of the native culture became increasingly severe. Mission Indians fleeing the restrictive and unfamiliar life of the missions, introduced new ideas and tools. Population shifts, prompted by the eastward retreat of Indians closer to the missions, forced adjustments in territorial boundaries with concomitant movement into the eastern foothills (Peak, 1975:14).

By the early 1820s, mission expansion in California ended as a result of Mexico's independence from Spain. It was also during this time that fur trappers discovered the California interior and began their forays into the San Joaquin Valley. Jedediah Smith may have been the first to enter the Fresno area during a fur trapping expedition in 1827. Smith's adventures included friendly encounters with the Southern Yokuts near the Kings River and trapping and camping along the San Joaquin River. Other trappers such as Kit Carson, Peter Skene Ogden of the Hudson's Bay Company and Joseph Reddeford Walker followed Smith until about 1837 when fur bearing animals had been depleted.

8.3.2.4.2 Mexican Period

Spanish colonial occupation of Alta California ended with the Mexican takeover in 1821. The Mexicans did not systematically explore the region to any significant extent. In 1833 there was a revolt against Franciscan rule in Alta California resulting in the complete secularization of mission lands. It was during this period that most significant cultural deterioration took place amongst the Yokuts. Native peoples had no natural immunity to introduced diseases and nearly 75 percent of the Valley Yokuts population succumbed in the early 1830s to an illness Cook (1955) believes was malaria.

Between 1833 and 1845, some remnant bands of economically desperate Valley Yokuts conducted raids against the coastal missions west of the Diablo Range. To mitigate the effects of Indian raiding against their wealthy coastal missions and ranchos, the Mexican government began awarding large

land grants in the Sacramento-San Joaquin Valley region in the late 1830s and that these ranchos would serve as frontier buffers. By the mid-1840s, several large land grants were made encompassing most all of the lands bordering the San Joaquin River from Stockton to Fresno County (Werner, 1984:17).

The first immigrants to the project area were Sonoran Mexican, Chilean and Californiano vaqueros and their families who lived and worked in west Fresno County during the first half of the 19th century. They captured wild horses, rounded up Indians to take to the Spanish missions on the coast and drove cattle along El Camino Viejo a Los Angeles (The Old Road to Los Angeles). This old road was later used as a stage coach road and later still for the railroad bed and Colorado Road (Clough and Secrest, 1984:39).

Increasingly bad relations between the United States and Mexico led to the Mexican-American War of 1847, which resulted in Mexico releasing California to the United States under the Treaty of Guadalupe Hidalgo in 1848. The discovery of gold in the Sierra foothills attracted large numbers of miners in the years following 1848. Foothill dwelling Indians, that had retained a modicum of protection from white domination and culture change, were driven from their homes along the streams and rivers. Forced to retreat to marginal lands, starvation, disease, and outright conflict soon completed the cycle. The decline of mining was soon followed by a shift of attention to the rich agricultural promise of the Valley. The remaining Valley Yokuts were pressured from the lands they held, usually those of highest farming potential, and driven into the mountains (Peak, 1975:15).

8.3.2.4.3 American Period

The CVEC project areas lies substantially within what was once the large J.G. (Jefferson Gilbert) James Ranch which was acquired in the mid 1850s through the 1870s with profits garnered from the California gold fields and cattle ranching. James was one of the first Anglo cattlemen in the area, registering his brand in 1856. He was also a leader in West Side irrigation, building the Kings River By-Pass Canal, and a system of levees and pumps to divert Kings River/Fresno Slough water to farms on his 150,000 acres. James' residence, located north of what is now the City of San Joaquin, was destroyed by fire in 1893 (see Garrison, 1991:126; Bissonnette, 1992:7). The James Ranch eventually included 150,000 acres and was 2 to 3 miles wide and about 15 miles long, including land on both sides of the Fresno Slough (Bissonnette, 1991:6).

James moved to Stockton in 1866 and later to San Francisco where he was elected to the Board of Supervisors in 1882. His cattle ranch was tied up in legal battles over water rights for many years; after his death in 1910, the San Joaquin townsite was platted by new owners (and originally named Gravesboro and then Grahamtown). In 1913, a Los Angeles real estate syndicate purchased the remaining James Ranch lands and changed the name of the townsite to San Joaquin. Wells and ditches were dug for a new irrigation district and in 1920 the city was incorporated (Clough and Secrest, 1984).

A brochure prepared in 1913, after James' death, touted alfalfa as the major crop on the 72,000 acres put up for sale on the ranch (Kleinberger and Edwards, 1913). Points of interest on the James Ranch included the Tuft Brothers Ranch with its artesian well (located at Calaveras Avenue), the Traction Ranch names after the huge Daniel Best tractor that was used to farm the area, the townsite of Jameson on the Southern Pacific Railroad, and two "old lake beds" north of the Watson's Station and Landing site near "Old Fresno" (Garrison, 1991).

Stage roads linked the project area with the rest of the country beginning in the late 1850s-1860s with the Butterfield Overland Mail Company's first run from St. Louis, through the southwest, and up the San Joaquin Valley to San Francisco in 1858. Two stage roads and "Hawthorn Station" appear in the vicinity of San Joaquin on the State Geological Survey map of Central California in 1873 (see Clough

and Secrest 1984). The Hanford and Summit Lake Railroad line was extended north to Tranquillity from Riverdale, past the project area, in 1912 (and was later purchased by the Southern Pacific).

The agricultural potential of the Valley was quickly recognized and intensive alteration of the area made it increasingly suitable for cultivation. Marshes and lakes were drained, and elaborate irrigation systems were established. Today, the valley floor for the most part bears little resemblance to its natural condition; the oak groves are gone and the lakes are dry. The vast marshes, once the refuge for enormous flocks of waterfowl, are no longer extant. The grazing fields of the elk and antelope have become cultivated fields, producing a wide array of crops. The native faunal community, with the exception of burrowing mammals, has been replaced by domestic livestock (Weber, 1978:15).

The town of San Joaquin was booming in the 1910s and 1920s. The branch line of the Southern Pacific ran twice each way daily. In the early 1920s, there was a theater, butcher shop, two garages, two stores, a bank, a hotel, pool hall, and lumber yard. In 1926, water prices were raised and alfalfa crops died due to a mineral in the wells that killed the crops. By 1927, the town had been reduced to one store and one garage (Peak and Associates, 1988a:4).

More recent events on the West Side include the formation of the Westland Water District in 1951, which is the largest irrigation district in the country and its founders' demands for increased water deliveries to the area led to a doubling of the acreage planted in cotton to 1.2 million acres by 1953 (Hall, 1986:185).

8.3.2.5 Resources Inventory

The CVEC project site and linear facilities were subject to cultural resources inventory by CH2M HILL. This resources inventory is based on both archive/background research and surface pedestrian reconnaissance survey. A detailed discussion of the results of the resource inventory is presented in the subsections below.

8.3.2.5.1 Archival Research

CH2M HILL commissioned a detailed record search by staff (Adele Baldwin) of the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (California State University, Bakersfield) for the CVEC project (RS# 01-293) using a very generous definition of "project area" (e.g., one-mile plus buffer zone around project site and linear features). According to information available in the CHRIS files, there have been 30 previous cultural resource surveys conducted within the "project area" (a copy of the CHRIS-annotated United States Geological Survey quadrangle maps is provided to the CEC as a Confidential Appendix 8.3C). Within or adjacent to this rather generous CH2M HILL-defined "project area" are 19 recorded cultural resources, but none of these resources are listed in the NRHP (nor in the California Inventory of Historic Places, the California Points of Historic Interest, or the California State Historic Landmarks). CHRIS reported that the Fresno Slough Bypass is located in the vicinity of San Joaquin and that it is a 2D2-determined eligible (cultural resource) for listing as a 'contributor' by consensus determination. A brief description of the recorded cultural resources is presented below.

CA-FRE-342 (P-10-000342)

Prehistoric archaeological site CA-FRE-342 is located on the Charles Kinnunen Ranch (January 1961) (see Confidential Appendix 8.3C for a mapped location). The site is a sand mound burial knoll, originally 8 to 10 feet higher than surrounding farmland. Some 3 to 4 feet of earth were removed between 1937 and 1960; and 2 more feet removed in January 1961 exposing a human skull. Darker colored soil deposits and numerous small shells characterize the sediments in the vicinity of the skull.

CA-FRE-343 (P-10-000343)

Prehistoric archaeological site CA-FRE-343 (also known as the Old Mullins Ranch) is located about 1 mile NE of CA-FRE-342 on land farmed by Mike Etcheberry (in January 1961) (see Confidential Appendix 8.3C for a mapped location). Eleven Olivella shell beads, two nearly complete Olivella shells and three fish spear fragments are known to be part of this site's artifact assemblage.

CA-FRE-531 (P-10-000531)

Prehistoric archaeological site CA-FRE-531 was excavated in 1963 and yielded human burials, house pits, flaked-stone debitage, shellfish remains and portable mortars (see Confidential Appendix 8.3C for a mapped location).

CA-FRE-552 (P-10-000552)

Prehistoric archaeological site CA-FRE-552 consists of a mineralized human mandible (see Confidential Appendix 8.3C for a mapped location).

CA-FRE-553 (P-10-000553)

Prehistoric archaeological site CA-FRE-553 is a mound feature that contains two housepit features, a shaped bowl mortar fragment, fire-cracked rock and flaked-stone debitage (see Confidential Appendix 8.3C for a mapped location).

CA-FRE-554 (P-10-000554)

Prehistoric archaeological site CA-FRE-554 is located on a low rise east of James Bypass. (see Confidential Appendix 8.3C for a mapped location). A cobble mano fragment was found at this site.

CA-FRE-555 (P-10-000555)

Prehistoric archaeological site CA-FRE-555 consists of one housepit and one obsidian flake (see Confidential Appendix 8.3C for a mapped location).

CA-FRE-556 (P-10-000556)

Prehistoric archaeological site CA-FRE-556 is located on a rise just northeast of James Bypass (see Confidential Appendix 8.3C for a mapped location). The site consists of two 3-meter diameter housepit depressions.

CA-FRE-557 (P-10-000557)

Prehistoric archaeological site CA-FRE-557 is located on a low just northeast of James Bypass (see Confidential Appendix 8.3C for a mapped location). Two flakes were found on the surface.

CA-FRE-558 (P-10-000558)

Prehistoric archaeological site CA-FRE-558 is located on a low rise northeast of James Bypass (see Confidential Appendix 8.3C for a mapped location). The site consists of three 4-meter diameter housepit depressions.

CA-FRE-559 (P-10-000559)

Prehistoric archaeological site CA-FRE-559 is located east of James Bypass (see Confidential Appendix 8.3C for a mapped location). Two small bowl mortar fragments, a core with large flake-removal scars, flaked-stone debitage, shell and bird bone was found at this site.

CA-FRE-560 (P-10-000560)

Prehistoric archaeological site CA-FRE-560 is located on a low mound northeast of James Bypass (see Confidential Appendix 8.3C for a mapped location). This site has 7 housepits with diameters greater than 5 meters; the deepest housepit depression is 30 cm. Three smaller housepits with diameters smaller than 3 meters are also present.

CA-FRE-561 (P-10-000561)
Prehistoric archaeological site CA-FRE-561 is located on a very high mound with markedly darker soil than surrounding area (see Confidential Appendix 8.3C for a mapped location). No other information is available about the site.

CA-FRE-565 (P-10-000565)
Prehistoric archaeological site CA-FRE-565 is situated on a mound with a farmhouse on top located east of James Bypass (see Confidential Appendix 8.3C for a mapped location). No other information is available about the site.

CA-FRE-566 (P-10-000566)
Prehistoric archaeological site CA-FRE-566 is situated on a well defined mound located east of James Bypass (see Confidential Appendix 8.3C for a mapped location). No other information is available about the site.

CA-FRE-567 (P-10-000567)
Prehistoric archaeological site CA-FRE-567 is a mound remnant located east of James Bypass (see Confidential Appendix 8.3C for a mapped location). Fire-cracked rock and flaked stone lithic debitage is present.

CA-FRE-1057 (P-10-001057)
Prehistoric archaeological site CA-FRE-1057 is located north of Fish Slough (see Confidential Appendix 8.3C for a mapped location). The site consists of a small mound rising about 2 meters above the slough with dark gray friable soil (midden). No artifacts were observed on the surface, but the archaeologists that recorded the site indicated the site should be resurveyed when dense vegetation is not present.

CA-FRE-2222 (P-10-002222)
Prehistoric archaeological site CA-FRE-2222 is located in a plowed field on the east side of San Mateo Avenue. A pestle and several flakes were found.

CA-FRE-3064H (P-10-003081)
Historic archaeological site CA-FRE-3064H is just south of Jensen Avenue (see Confidential Appendix 8.3C for a mapped location). The site consists of a scatter of historic debris situated on a flat alluvial terrace within the wastewater treatment facility. Materials noted include bottle fragments (green, brown, cobalt, white, and clear glass), miscellaneous glass, ceramic, brick, and concrete chunks. Most items appear to date from the 1930s or 1940s with more recent debris intermixed.

Thirty individual cultural resource investigation reports were provided by CHRIS for the "project area." In some cases, these previous investigations overlap CVEC linear facility corridors; Figure 8.3-1 illustrates the locations/footprints of previous investigations. Arranged in ascending order as cataloged by CHRIS, the reports listed in Table 8.3-4 were reviewed for information pertinent to the CVEC project.

8.3.2.5.2 Field Survey
A complete general reconnaissance for archaeological resources (after King, Moratto, and Leonard 1973) was completed by CH2M HILL (Dr. James C. Bard, RPA; Mr. Jim Sharpe, M.S., and Ms. Alicia Bergstad, B.S.) on July 13 to 15, and October 18 to 19, 2001. With the exception of one isolated prehistoric Native American artifact discovered along the edge of Manning Avenue (see Confidential Appendix 8.3D), no archaeological sites or isolates (prehistoric or historic) were found. However, an interview with Mr. Brad Berrecart identified the location of a possible Indian burial site (see Confidential Appendix 8.3D)

TABLE 8.3-4
Authors (Dates) and CHRIS Catalog Number for Cultural Resource Investigation Reports

Flint (1996) – FR-00021	Osborne and Comeyne (1994) – FR-00596
Wren (1997) – FR-00022	Osborne and Comeyne (1994b) – FR-00598
Bissonnette (1991) – FR-00116	Osborne and Comeyne (1994a) – FR-00599
Sutton (1989) – FR-00227	Peak & Associates (1988b) – FR-00631
Weber (1978) – FR-00229	Peak & Associates (1988a) – FR-00632
Flint and Hooper (1999) – FR-00255	Peak (1975) – FR-00664 & FR-00185
Bissonnette (1992) – FR-00285	Scott (1992) – FR-00693
Bissonnette (1994) – FR-00301	Varner (1975) – FR-00765
Canaday, Ostrogorsky and Hess (1992) – FR-00320	Weaver (1988) – FR-00804
Moratto and Jackson (1990) – FR-00321	Werner (1984) – FR-00807
Davis, Dick and Varner (1977) – FR-00433	Wren and Crist (1975) – FR-01130
Kus and Mader (1995) – FR-00511	Price (1993) – FR-01131
Murphy (1990) – FR-00561	Caruso (1985) – FR-01202
Noble and Weigel (1988) – FR-00576	Flint (1999) – FR-01618
Binning, Mandy and Wallace (1999) – FR-01640	

Plant Site

The proposed plant site could not be surveyed in July 2001 due to the presence of a cotton crop. Unfortunately, the cotton crop was still unharvested on October 18 and 19, 2001. The proposed plant site will be surveyed when the cotton crop has been harvested and/or when the subject parcel is fallow. The site and domestic and sanitary sewer lines will also be surveyed when the cotton crop has been harvested and/or when the subject parcel and domestic and sanitary sewer line footprints are in fallow. The information will be made available to the CEC as soon as possible.

The proposed domestic and sanitary sewer lines leaving the proposed plant site that would be constructed along Cherry Lane and between Cherry Lane and Manning Avenue could not be surveyed on October 18 and 19, 2001 due to lack of landowner access. These proposed lines will also be surveyed when landowner access is granted and the information will be made available to the CEC as soon as possible.

Gas and Water Lines

With a few exceptions (access precluded by lack of landowner access and/or presence of unharvested crops, as depicted in Confidential Appendix 8.3C), all of the natural gas supply and water supply pipline corridors were surveyed in July 2001. With the exception of one isolated prehistoric artifact (a shaped cobble mano - grinding stone implement), no archaeological sites or isolates (prehistoric or historic) were found. Confidential Appendix 8.3C illustrates the combined coverage of CH2M HILL's surveyed areas and those areas surveyed previously by others.

The 2 miles of proposed water line on Chateau Fresno Road (between Lincoln and Central Roads) that could not be surveyed in July 2001 were surveyed on October 18 and 19, 2001. The northern half of the road contained grape fields on both sides. The southern half of the road was open plowed ground. Visibility was near 100 percent on the dirt road and a 60-foot wide corridor was surveyed. No cultural resources were observed.

The other segment that could not be surveyed in July 2001 (the dirt road that borders the west and south sides of the Fresno-Clovis WWTF) was surveyed on October 18 and 19, 2001. The western

portion was on the south side of Dry Creek Canal from North Avenue to Muscat Road. The southern portion bordered the cyclone fence on the south side of the treatment plant. The corridor surveyed was about 30 feet wide. No cultural resources were observed.

Transmission Corridors

The route for the 230-kV interconnect and 70-kV reroute was surveyed on October 18 and 19, 2001. This corridor extends from the Helm Substation to CVEC at Springfield Road. The surveyed corridor is about 1,500 feet north/south by about 750 feet east/west and extends from the Helm Substation north to Springfield Road. The corridor was found to be a recently harvested cornfield with excellent surface visibility approaching 85 percent. No cultural resources were observed.

8.3.2.5.3 Architectural Reconnaissance

A complete general reconnaissance for architectural resources was performed during the field surveys (July 13-15, 2001 [Dr. James C. Bard, RPA; Mr. Jim Sharpe, M.S., Ms. Alicia Bergstad, B.S.] and October 18-19, 2001 [Mr. Jim Sharpe, M.S. and Ms. Laurie Wyatt, M.S.]). The project area for possible indirect impacts to architectural resources are those resources located within one-half mile of the actual project footprint. The project area for possible direct impacts to architectural resources are those resources located within or immediately adjacent to the actual project footprint or within 100 feet of the linear corridors. Architectural resources include all standing homes, farmsteads, and commercial/industrial facilities as well as fences, transmission lines (including telegraph poles), irrigation ditches, and visible wells that lie within or adjacent to the project footprint or linear corridors. Only resources within the project area for possible direct impacts to architectural resources were surveyed/inspected. To put the area in context, Figure 8.4-4 provides a characterization of the land uses along the linear routes and Figure 8.4-1 provides a characterization of land uses near the plant site.

Only properties 50 years of age or older can qualify as historic properties eligible for inclusion in the NRHP. However, properties 45 years or older were surveyed to accommodate the preference of CEC staff to ensure properties in process for inclusion in the NRHP are also reviewed.

In addition to the field surveys, the Fresno County Historical Society and the Fresno County Library historical expert were contacted and did not identify any structures of historical importance within 1/4 mile of the site, natural gas, or water lines (Hiigel, 2001; Silvia, 2001). The Phase I Environmental Site Assessment was reviewed for potential architecturally significant resources, such as wells.

Homes, farmsteads, and commercial/industrial facilities, fences, transmission lines (including telegraph poles), irrigation ditches, and visible wells older than 45 years are potentially significant historic resources in the project area and along the linear corridors. During either the July or October 2001 surveys, CH2M HILL did not observe any potentially significant historic buildings or structures within the CVEC project area or linear corridors as described below.

Plant Site (including domestic water and sewer lines)

Structures within one half mile of the project site include occupied residences to the west of the proposed plant site, occupied commercial, industrial and office buildings to the north of the project site, and an irrigation canal on the southern boundary of the plant site property. None of these properties are historically or architecturally significant.

The Phase I ESA identified an easement on the southern border of the proposed site that may have been related to a historical water well. As indicated in the Phase I ESA, a James Irrigation District representative was not able to provide further information on the status of a well, nor was the well able to be located during the ESA field survey. The USGS well database indicates a well in the area

of the easement was installed in 1915 and is listed as "Destroyed, Unused". This easement is not proposed to be disturbed by the project.

Irrigation ditches within 1 mile of the project site and 100 feet of the linear features are owned by James Irrigation District or other local water districts. Irrigation ditches were likely installed as early as the 1950s in the area, but are maintained on an annual basis. Maintenance could include removal of vegetation, recontouring of the ditch and replacement of any mechanical parts, as necessary. Therefore, it is not expected that irrigation ditches in the vicinity of the project site and linear features are of significant architectural or historical value.

Gas and Water Lines

There are no structures within one hundred feet of the proposed gas and water lines. The area surrounding these lines is comprised of open agricultural land.

Transmission Lines

Structures within one hundred feet of the proposed 230-kV transmission line interconnect and the 70-kV reroute include transmission poles that have no historical or architectural significance.

8.3.2.5.4 Native American Consultation

CH2M HILL contacted the NAHC by letter on June 4, 2001, to request information about traditional cultural properties such as cemeteries and sacred places in the project area. The NAHC responded on June 27, 2001, with a listing of three Native American contacts for the general project area (persons or organizations of Yokut heritage): Santa Rosa Rancheria in Lemoore (Mr. Mike Sisco), Table Mountain Rancheria in Friant (Ms. Lee Ann Walker Grant), and the Central Valley & Mountain Reinterment Association in Clovis (Ms. Lorrie Planas). Each of these individuals/groups was contacted by letter on July 2, 2001. (See Appendix 8.3A). A summary of the results of consultations with the individual Native American organizations on the NAHC contact list will be included in a future filing.

The NAHC record search of the Sacred Lands file failed to indicate the presence of Native American cultural resources in the immediate project area. The record search conducted at the Southern San Joaquin Valley Information Center of the CHRIS for CH2M HILL (RS# 01-293) failed to indicate the presence of Native American traditional cultural properties.

8.3.3 Environmental Consequences

This section describes the environmental consequences of proposed CVEC construction.

Portions of the CVEC project area were previously surveyed by others. Unsurveyed areas were inspected by CH2M HILL with the exception of the plant site and the proposed domestic and sewer line interconnections between the plant site and the intersection of Pine Avenue and Manning Avenue where landowner entry permission was not available (see Confidential Appendix 8.3C). These unsurveyed areas will be inspected as soon as landowner entry permission is secured.

With the exception of the currently unsurveyed areas (see above), CH2M HILL conducted archival research, reviewed all cultural resource investigation reports within the CVEC project area, contacted all other interested agencies, Native American groups and historic societies, and conducted a complete field investigation. As a result of all these efforts, CH2M HILL did not detect within the project area any significant prehistoric or historic archeological remains, or any historically or architecturally significant buildings. No impacts to architectural resources are expected to occur.

8.3.4 Cumulative Effects

Since the CVEC project would not affect known significant cultural resources, it would not likely cause significant cumulative impacts. If construction was to encounter a large, stratified, buried prehistoric archaeological site, or discrete filled-in historic period features, the possibility of cumulative impacts would arise because such sites might be highly significant, and many have been destroyed or damaged by agricultural activity and/or commercial/industrial/residential development in the project vicinity. Given the relative low-level of impact to such a site that the project would cause, it is also possible that proposed project activities would not lead to significant cumulative impacts, depending on the extent of project impact to any such discovered archaeological deposits. Any potential impact to an unknown site would be minimized by monitoring during construction (Section 8.3.5) and by stop-work procedures if a site were uncovered. No impacts to architectural resources are expected to occur.

8.3.5 Mitigation Measures

CEC's cultural resource staff believe the best mitigation strategy is to avoid impact to cultural resources that may be located in a given project area. Avoidance can be accomplished by having the archaeologist and project engineer demarcate cultural resource site boundaries on the ground to ensure that proposed project improvements do not impinge on the resource(s). Where a project facility must be placed within 100 feet of a known archaeological site, the site can be temporarily fenced or otherwise marked on the ground as an Environmentally Sensitive Area (ESA). Construction equipment can then be directed away from the ESA, and construction personnel directed to avoid entering the ESA.

Prior to starting construction near a designated ESA, the construction crew should be informed of the resource values involved and of the regulatory protections afforded to the resources through an employee training program.

Though significant archaeological and historical sites were not found during project field survey conducted by CH2M HILL, it is possible that subsurface construction could encounter buried archaeological remains. Since several prehistoric archaeological sites and isolated artifacts have been found in the archaeologically sensitive vicinity of James Bypass, CH2M HILL recommends that construction monitoring take place in sensitive areas. This corresponds to the vicinity of James Bypass where several known/recorded prehistoric sites are present and where the isolated find (edge-ground cobble tool) was found by CH2M HILL (see Confidential Appendix 8.3D). In addition, based on the testimony of Mr. Brad Berrecart, CH2M HILL also recommends that construction monitoring take place in the areas specified by him as a potential Indian burial site (see Confidential Appendix 8.3E).

8.3.5.1 Pre-construction Subsurface Testing

Pre-construction testing is a form of enhanced survey in that surface survey cannot, in normal circumstances, result in reliable detection of buried archaeological sites. Subsurface testing, therefore, completes the survey by compensating for the presence of site-obscuring overburden. Pre-construction subsurface testing is not recommended.

8.3.5.2 Monitoring During Construction

If the CEC determines that monitoring is required, qualified personnel consisting of a Project Archaeologist (PA) and an Archaeological Monitor (AM), should conduct the required monitoring. The PA and AM can be the same person, if properly qualified. Proper qualifications for a PA are the minimum qualifications for Principal Investigator on federal projects under the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. The AM should have

5 years of experience in conducting archaeological field projects or hold a Bachelors degree in anthropology, with an emphasis in archaeology, and have at least 1 year of experience in conducting archaeological field projects. The AM should be qualified to detect archaeological deposits in the field. In addition to site detection, the PA should be qualified to evaluate the significance of the deposits, consult with regulatory agencies, and plan site evaluation and mitigation work.

To ensure participation by interested members of the Yokut Indian community, it is recommended that a Yokut Indian monitor be present during any needed archaeological site testing and/or data recovery operations triggered as a consequence of archaeological remains being discovered during construction. The Yokut Indian monitor can be retained either directly by the project Applicant or through the subconsultant conducting the actual archaeological fieldwork.

A six-point archaeological monitoring program should be implemented as follows:

1. Preconstruction Assessment and Construction Training—The PA and AM will visit the project area before construction begins to become familiar with site conditions. As construction begins, the PA will conduct a worker education session for construction supervisory personnel to explain the importance of, and legal basis for, the protection of significant archaeological resources. This worker education session can take place at the same time as the paleontological training session because both disciplines will involve the monitoring of excavation activities.

2. Construction Monitoring—The AM should be present at the construction site at all times when excavation is taking place within the zone of archaeological sensitivity. The AM's role will be to watch for buried archaeological deposits during subsurface excavations.

   If the AM identifies archaeological remains during construction, the AM should immediately notify the PA and Site Superintendent, who should halt construction in the immediate vicinity of the find, as necessary. The Superintendent and AM will use flagging tape, rope, or other means to delineate the area of the find within which construction will halt. This area should include the excavation trench from which the archaeological finds came and any piles of dirt or rock spoil from that area. Construction should not take place within the delineated find area until the PA, in consultation with CEC staff, can inspect and evaluate the find.

3. Site Recording and Evaluation—The PA and/or AM should follow accepted professional standards in recording any find and should submit the standard Department of Parks and Recreation (DPR) Primary Record forms (Form DPR 523) and location information to the Southern San Joaquin Valley Information Center of the California Historical Resources Information System (California State University, Bakersfield).

   If the PA determines that the find is insignificant, construction will proceed. If the PA determines that further information is needed to evaluate significance, the CEC and SHPO will be notified, and the consultant will prepare a plan and a timetable for evaluating the find, in consultation with the CEC and SHPO.

   Under CEQA, a find would be considered significant (would be classified as an "important archaeological resource") if it:

   - Is associated with an event or person of:
     - Recognized significance in California or American history, or
     - Recognized scientific importance in prehistory, or
   - Can provide information that is both of demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions; or

- Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind; or
- Is at least 100 years old and possesses substantial stratigraphic integrity; or
- Involves important research questions that historical research has shown can be answered only with archaeological methods.

Under the NHPA, a find is significant if it meets the NRHP listing criteria at 36 CFR 60.4:

- The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:
  - That are associated with events that have made a significant contribution to the broad patterns of our history, or
  - That are associated with the lives of persons significant in our past, or
  - That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
  - That have yielded, or may be likely to yield, information important in prehistory or history.

If human remains are found during construction, project officials are required by the California Health and Safety Code (Section 7050.5) to contact the County Coroner. If the Coroner determines that the find is Native American, he/she must contact the NAHC. The NAHC, as required by the Public Resources Code (Section 5097.98) determines and notifies the Most Likely Descendant (MLD), and requests the MLD to inspect the burial and make recommendations for treatment or disposal.

4. Mitigation Planning—If the PA and the consulting parties (the CEC, SHPO, the City of San Joaquin, Fresno County, NAHC-designated Most Likely Descendant, etc.) determine that the find is significant, they should prepare and carry out a mitigation plan in accordance with state (and federal if applicable) guidelines. This plan should emphasize the avoidance, if possible, of significant archaeological resources. If avoidance is not possible, the recovery of a sample of the deposit from which the archaeologist can define scientific data to address archaeological research questions should be considered an effective mitigation measure for damage to or destruction of the deposit (See Appendix 8.3B for the Proposed Native American Burial Protection Program Plan for the project).

   The mitigation program, if necessary, should be carried out as soon as possible to avoid construction delays. Construction should resume at the site as soon as the field data collection phase of any data recovery effort is completed. The PA will verify the completion of field data collection by letter to Calpine and the CEC so that Calpine can resume construction.

5. Curation—The PA will arrange for the curation of archaeological materials collected during the monitoring and mitigation program at a qualified curation facility. A qualified curation facility is a recognized, non-profit, archaeological repository with a permanent Curator. The PA shall submit field notes, stratigraphic drawings, and other materials developed as part of the archaeological excavation program to the curation facility along with the collection.

6. Report of Findings—If buried archaeological deposits are found during construction, the PA will prepare a report summarizing the monitoring and archaeological investigation program implemented to evaluate the find or to recover data from an archaeological site as a mitigation measure. This report should describe the site soils and stratigraphy, describe and analyze artifacts and other materials recovered, and explain the site's significance. This report should be submitted to the curation facility with the collection.

   Following these mitigation measures would lower any potential project effects on archaeological resources below the threshold of significance. Though it is possible that the project would encounter significant archaeological deposits, the monitor would be present to detect, evaluate, and recover them. The monitoring and mitigation program would, therefore, be effective.

   Emergency maintenance and repair could cause impacts to cultural resources. In developing specific mitigative measures to address impacts for any site that cannot be avoided during construction. The potential for ongoing impacts to any resource that cannot be avoided through project redesign must be considered. Any mitigative data recovery should be properly scoped, in conjunction with the appropriate agencies, to address potential long-term ongoing impacts.

8.3.6 Involved Agencies and Agency Contacts

Table 8.3-5 lists the state agencies involved in cultural resources management for the project and a contact person at each agency. These agencies include the California NAHC and, for federal lands, the California Office of Historic Preservation.

TABLE 8.3-5
Agency Contacts

Issue	Contact	Title	Telephone
Native American traditional cultural properties	Ms. Gail McNulty NAHC	Associate Government Program Analyst	(916) 653-4040
Federal agency NHPA Section 106 compliance	Mr. Knox Mellon California Office of Historic Preservation	SHPO	(916) 653-6624

8.3.7 Permits Required and Schedule

Other than certification by the CEC, no state, federal, or local permits are required by the project for the management of cultural resources. Consultation with SHPO and ACHP would be required under Section 106 if federal involvement is to occur and significant cultural resources could be affected by the project.

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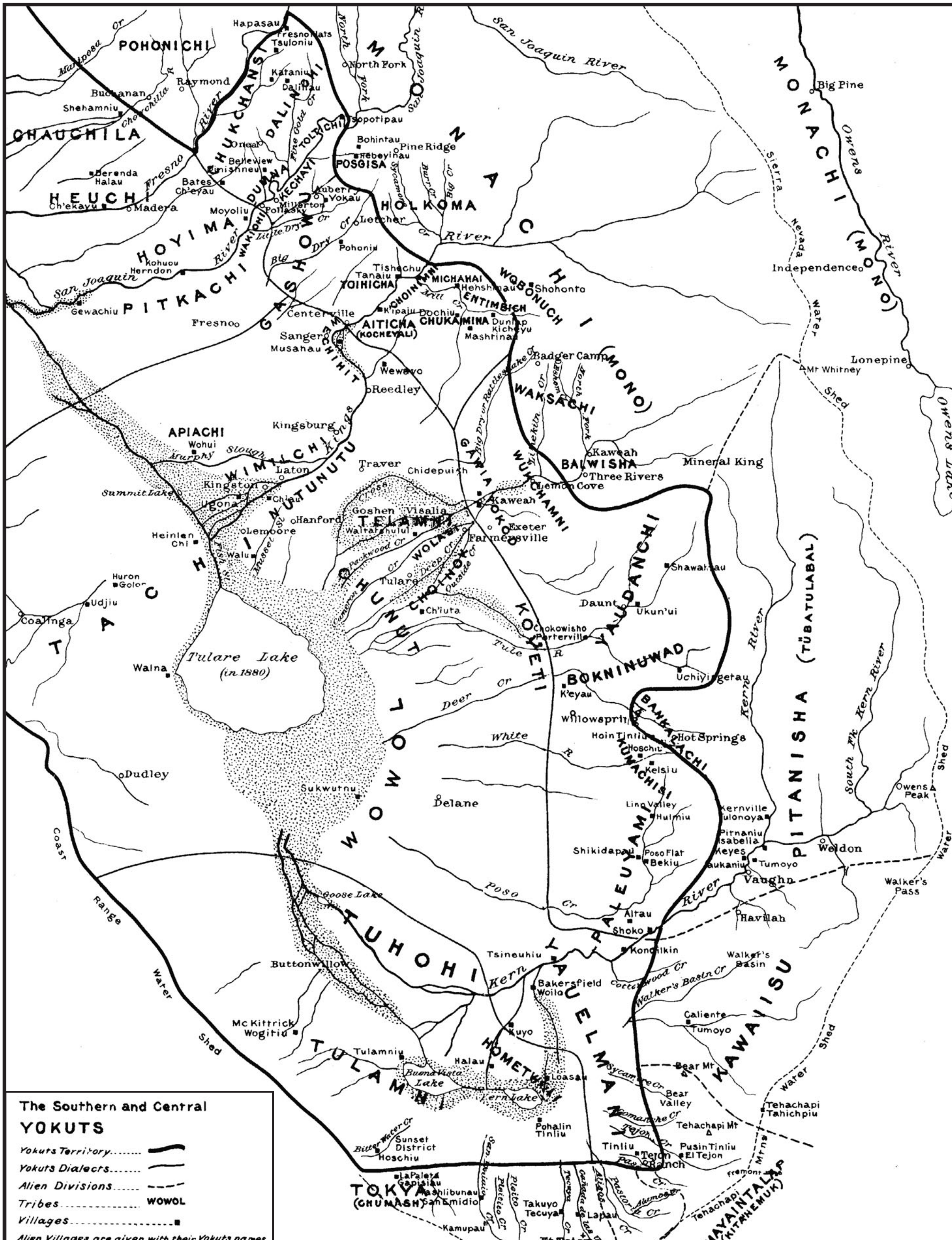

FIGURE 8.3-1
ETHNOGRAPHIC DISTRIBUTION IN PROJECT VICINITY
CENTRAL VALLEY ENERGY CENTER APPLICATION FOR CERTIFICATION

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